AMENDMENTS TO THE CLAIMS

Please amend the claims as follows. No new matter has been added.

1. (Currently Amended) A~~n~~ transmitting apparatus for reducing the peak-to-average power ratio (PAPR) of a signal transmitted on N (=2^r) sub-carriers in ~~a~~ the transmitting apparatus including encoders for block coding w input data, where r is a natural number more than 2, and outputting N code symbols in an orthogonal frequency division multiplexing (OFDM) ~~mobile~~ communication system, the transmitting apparatus comprising:

a serial to parallel (S/P) converter for converting a data stream in to w-(r-2) parallel data streams, where w is the length of an information word;

a first encoder for receiving w/2 parallel data streams of the w-(r-2) parallel data streams from the serial to parallel converter, block coding the w/2 parallel data streams, and outputting N/2 first code symbols;

an input operator generator for generating (r-2) input operator data streams according to the w-(r-2) parallel data streams; and

a second encoder for receiving the parallel data streams from the serial to parallel converter not input into the first encoder and the (r-2) input operator data streams, block coding the received data streams, and outputting N/2 second code symbols,

wherein the (r-2) input operator data streams make N code symbols complementary.

2. (Currently Amended) The transmitting apparatus of claim 1, wherein when the transmitting apparatus uses BPSK (Binary Phase Shift Keying), the input operator generator generates the input operator data streams by the following equation, where k represents a data stream output from the S/P converter,

$$\mathbf{k}_{2r} = -\mathbf{k}_2 \bullet \mathbf{k}_r \bullet \mathbf{k}_{r+2}$$

$$\mathbf{k}_{2r-i} = \mathbf{k}_1 \bullet \mathbf{k}_{r-i} \bullet \mathbf{k}_{r+1}, \quad i = 1, \ldots, (r-3).$$

3. (Currently Amended) The transmitting apparatus of claim 1, wherein when the transmitting apparatus uses QPSK (Quadrature Phase Shift Keying), the input operator generator generates the input operator data streams by the following equation, where k represents a data stream output from the S/P converter,

$$k_{b10} = k_{b1} \bullet k_{b2} \bullet k_{b3} \bullet k_{b4} \bullet k_{b7} \bullet k_{b8} \bullet k_{b9}$$

$$k_{s6} = \mathbf{mod}(\mathbf{mod}(k_{s2} + 1,2) \times 2 + k_{s2} + k_{s3} + k_{s5},4)$$

where mod (x, M) denotes modulo M for x.

4. (Currently Amended) A transmitting method ~~of~~ for reducing the peak-to-average power ratio (PAPR) of a signal transmitted on N ($=2^r$) sub-carriers in a transmitting apparatus including encoders for block coding w input data where r is a natural number more than 2, and outputting N code symbols in an orthogonal frequency division multiplexing (OFDM) ~~mobile~~ communication system, the transmitting method comprising ~~the steps of~~:

(1) converting a data stream in to w-(r-2) parallel data streams, where w is the length of an information word;

(2) block coding w/2 parallel data streams of the w-(r-2) parallel data streams and outputting N/2 first code symbols;

(3) generating (r-2) input operator data streams according to the w-(r-2) parallel data streams; and

(4) block coding the parallel data streams not subject to the block coding, and the (r-2) input operator data streams and outputting N/2 second code symbols,

wherein the (r-2) input operator data streams make N code symbols complementary.

5. (Currently Amended) The transmitting method of claim 4, wherein when the transmitting apparatus uses BPSK (Binary Phase Shift Keying), the input operator data streams are determined by the following equations, where k represents a converted data stream,

$$k_{2r} = -k_2 \bullet k_r \bullet k_{r+2}$$

$$k_{2r-i} = k_1 \bullet k_{r-i} \bullet k_{r+1}, \quad i = 1, \ldots, (r-3).$$

6. (Currently Amended) The transmitting method of claim 4, wherein when the transmitting apparatus uses QPSK (Quadrature Phase Shift Keying), the input operator data streams are generated by the following equations, where k represents a converted data stream,

$$k_{b10} = k_{b1} \bullet k_{b2} \bullet k_{b3} \bullet k_{b4} \bullet k_{b7} \bullet k_{b8} \bullet k_{b9}$$

$$k_{s6} = \mathbf{mod}(\mathbf{mod}(k_{s2} + 1,2) \times 2 + k_{s2} + k_{s3} + k_{s5},4)$$

where mod (x, M) denotes modulo M for x.

7. (Currently Amended) A transmitting method ~~of~~ for reducing the peak-to-average power ratio (PAPR) of a signal transmitted on a plurality of ($N=2^r$) sub-carriers in a transmitting apparatus including a serial to parallel converter for converting a serial data in to parallel data streams $k_1, k_2, \ldots, k_{r+2}$ and a plurality of encoders for block coding the parallel data streams $k_1, k_2, \ldots, k_{r+2}$ in an orthogonal frequency division multiplexing (OFDM) mobile communication system where r is a natural number more than 2, the transmitting method comprising ~~the steps of~~:

receiving at least one of the parallel data streams and generating at least one operator bit $k_{r+3}, \ldots, k_{2r}$ that renders block coded symbols complementary; and

distributing the parallel data streams and the at least one operator bit equally to the encoders and block coding the distributed data, where t is the number of encoders.

8. (Currently Amended) The transmitting method of claim 7, wherein the number of operator bits is determined as r-2 according to the number of sub-carriers.

9. (Currently Amended) The transmitting method of claim 7, wherein when the transmitting apparatus uses BPSK (Binary Phase Shift Keying), the input operator data streams are determined by the following equations, where k represents a converted data stream,

$$k_{2r} = -k_2 \bullet k_r \bullet k_{r+2}$$

$$k_{2r-i} = k_1 \bullet k_{r-i} \bullet k_{r+1}, \quad i = 1, \ldots, (r-3).$$

10. (Currently Amended) The transmitting method of claim 7, wherein when the transmitting apparatus uses QPSK (Quadrature Phase Shift Keying), the input operator data streams are determined by the following equations, where k represents a converted data stream,

$$k_{b10} = k_{b1} \bullet k_{b2} \bullet k_{b3} \bullet k_{b4} \bullet k_{b7} \bullet k_{b8} \bullet k_{b9}$$

$$k_{s6} = \mathbf{mod}(\mathbf{mod}(k_{s2} + 1,2) \times 2 + k_{s2} + k_{s3} + k_{s5},4)$$

where mod (x, M) denotes modulo M for x.

11. (Currently Amended) ~~An~~ transmitting apparatus for reducing the peak-to-average power ratio (PAPR) of a signal transmitted on a plurality of ($N=2^r$) sub-carriers in ~~a~~ the transmitting apparatus including a serial to parallel converter for converting a serial data in to parallel data streams $k_1, k_2, \ldots, k_{r+2}$ in an orthogonal frequency division multiplexing (OFDM) ~~mobile~~ communication system where r is a natural number more than 2, the transmitting apparatus comprising:

an operator generator for receiving at least one of the parallel data streams and generating at least one operator bit $k_{r+3}, \ldots, k_{2r}$ that renders block coded symbols complementary; and

a plurality of encoders, each for receiving an equal number of the parallel data streams and the at least one operator bit $k_{r+3}, \ldots, k_{2r}$ and block coding the received data.

12. (Currently Amended) The transmitting apparatus of claim 11, wherein the number of operator bits is determined as r-2 according to the number of sub-carriers.

13. (Currently Amended) The transmitting apparatus of claim 11, wherein when the transmitting apparatus uses BPSK (Binary Phase Shift Keying), the operator generator determines the input operator data streams by the following equations, where k represents a converted data stream,

$$k_{2r} = -k_2 \bullet k_r \bullet k_{r+2}$$

$$k_{2r-i} = k_1 \bullet k_{r-i} \bullet k_{r+1}, \quad i = 1, \ldots, (r\text{-}3).$$

14. (Currently Amended) The transmitting apparatus of claim 11, wherein when the transmitting apparatus uses QPSK (Quadrature Phase Shift Keying), the operator generator determines the input operator data streams by the following equations, where k represents a converted data stream,

$$k_{b10} = k_{b1} \bullet k_{b2} \bullet k_{b3} \bullet k_{b4} \bullet k_{b7} \bullet k_{b8} \bullet k_{b9}$$

$$k_{s6} = \mathbf{mod}(\mathbf{mod}(k_{s2} + 1,2) \times 2 + k_{s2} + k_{s3} + k_{s5},4)$$

where mod (x, M) denotes modulo M for x.

15. (Currently Amended) A receiving method ~~of~~ for demodulating decoded data streams k_1, k_2, . . ., k_{2r} in a receiving apparatus that converts a serial input signal in to parallel data streams where r is a natural number more than 2, Fourier-transforming the parallel data streams, and distributing the Fourier-transformed data equally to a plurality of decoders in an orthogonal frequency division multiplexing (OFDM) mobile communication system, the receiving method comprising ~~the steps of~~:

identifying at least one operator bit k_{r+3}, . . ., k_{2r} from the decoded data streams;

removing the at least one operator bit from the decoded data streams; and

recovering source data from information data streams k_1, k_2, . . ., k_{r+2} free of the at least one operator bit.

16. (Currently Amended) The receiving method of claim 15, wherein the number of operator bits is determined as r-2 according to the number of sub-carriers used in a transmitting apparatus.

17. (Currently Amended) A~~n~~ receiving apparatus for demodulating decoded data streams k_1, k_2, . . ., k_{2r} in ~~a~~ the receiving apparatus including a serial to parallel converter for converting a serial input signal in to parallel data streams where r is a natural number more than 2, and a Fourier transformer for Fourier-transforming the parallel data streams in an orthogonal frequency division multiplexing (OFDM) mobile communication system, the receiving apparatus comprising:

a plurality of decoders, each for receiving an equal number of Fourier-transformed complementary sequences and decoding the received complementary sequences;

an operator remover for identifying at least one operator bit k_{r+3}, . . ., k_{2r} from the decoded data streams and removing the at least one operator bit from the decoded data streams; and

a demapper for recovering source data from information data streams k_1, k_2, . . ., k_{r+2} free of the at least one operator bit.

18. (Currently Amended) The receiving apparatus of claim 17, wherein the number of operator bits is determined as r-2 according to the number of sub-carriers used in a transmitting apparatus.